

CLAIMS

WHAT IS CLAIMED IS:

1. A light direction assembly, comprising:
tip-tilt platform having a first and second axes and having a light direction member coupled thereto;
first and second current coils coupled to said platform; and
a plurality of pole stand assemblies coupled to said first and second current coils and including a plurality of magnets,
wherein said magnets are configured to selectively tilt said tip-tilt platform with respect to first and second axes in response to first and second currents flowing through said first and second current coils.
2. The assembly of claim 1, wherein said first and second current coils are concentrically coupled to said tip-tilt platform.
3. The assembly of claim 1, wherein said light direction member comprises a reflecting light direction member.
4. The assembly of claim 1, wherein said light direction member comprises a refracting light direction member.
5. The assembly of claim 1, further comprising a base member wherein said post stand assemblies are coupled to said base and said tip-tilt platform is configured to move with respect to said base.
6. The assembly of claim 1, wherein said pole stand assemblies are first, second, third, and fourth pole stand assemblies each having first, second, third, and fourth inner and outer pole stands.

7. The assembly of claim 6, wherein said magnets are coupled to each of said inner and outer pole stands.

8. The assembly of claim 7, wherein control of said first current coil is sufficient to control rotation of said tip-tilt platform about said first axis.

9. The assembly of claim 7, wherein said magnets of said first and second inner pole stands produce a magnet field directed in a first direction and said third and fourth inner pole stands produce a magnetic field directed in a direction opposite to said first direction.

10. The assembly of claim 9, wherein said first direction is an inward direction and said opposite direction is an outward direction with respect to a central portion of said assembly.

11. The assembly of claim 6, wherein control of said second current coil is sufficient to control rotation of said tip-tilt platform about said second axis.

12. The assembly of claim 11, wherein said magnets of said second and third inner pole stands produce a magnet field directed in a first direction and said first and fourth inner pole stands produce a magnetic field directed in a direction opposite to said first direction.

13. The assembly of claim 12, wherein said first direction comprises an inward direction and said opposite direction comprises an outward direction with respect to a central portion of said assembly.

14. The assembly of claim 1, further comprising a spring assembly configured to urge said tip-tilt platform toward a biased position.

15. The assembly of claim 14, wherein said spring assembly comprises a plurality of cantilever springs.

16. A light direction system, comprising:
a light direction assembly including a tip-tilt platform having an inner and an outer current coil coupled thereto;
a base having a plurality of pole stand assemblies, wherein each pole stand assembly includes an inner and an outer pole stand each having a magnet coupled thereto wherein said inner pole stands are coupled to said inner coil and said outer pole stands are coupled to said outer current coils; and
a controller configured to apply a first current to said inner coil to control a rotation of said tip-tilt platform about a first axis and to apply a second current to said outer coil to control a rotation of said tip-tilt platform about a second axis.
17. The assembly of claim 16, wherein said pole stand assemblies are first, second, third and fourth pole stand assemblies each having first, second, third, and fourth inner and outer pole stands.
18. The assembly of claim 16, wherein said tip-tilt platform includes first, second third and fourth corners and said controller is configured to move said tip-tilt platform between a plurality of positions.
19. The assembly of claim 18, wherein said plurality of positions comprises a first position, wherein said second corner is raised with respect to said base, a second position, wherein said fourth corner is raised with respect to said base, a third position wherein said third corner is raised with respect to said base, and a fourth position wherein said first corner is raised with respect to said base.
20. The assembly of claim 19, wherein said controller is configured to move said tip-tilt platform between said first, second, third, and fourth positions at a rate of between 120 and 240 cycles per second.

21. A method of controlling rotation of a tip-tilt platform, comprising:
controlling a first current in a first current coil to control rotation of said tip-tilt platform about a first axis; and
controlling a second current in a second current coil to control rotation of said tip-tilt platform about a second axis wherein said second axis is disposed at an angle with respect to said first axis.

22. The method of claim 21, wherein controlling said first current comprises applying a first current to a first current coil to cause rotation of said tip-tilt platform in a first direction about said first axis and reversing a direction of said first current to cause said tip-tilt platform to rotate in a second direction which is opposite of said first direction, and wherein controlling said second current comprises applying said second current to a second current coil to cause rotation of said tip-tilt platform in a third direction about a second axis; and reversing a direction of said second current to cause said tip-tilt platform to rotate in a fourth direction which is opposite of said third direction.

23. The method of claim 22, wherein said currents are applied and reversed at a rate of at least 30 hertz.

24. The method of claim 23, wherein said rotation steps occur at an interval less than a flicker rate of a human eye.

25. The method of claim 22, further comprising applying a biasing force to said tip-tilt platform to return said tip-tilt platform to a biased position.

26. A light direction system, comprising:
means for providing light to a light direction member;
a means for controlling a first current to control rotation of said light direction member about a first axis; and
a means for controlling a second current to control rotation of said light direction member about a second axis.

27. The system of claim 26, further comprising means for restoring said light direction member to an unbiased position.

28. The system of claim 26, further comprising means for controlling the rotation of said light direction means about said first and second axes.